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TWO NEW SUBARBOREAL SPECIES OF THE ANT GENUS *STRUMIGENYS* (HYM., FORMICIDAE) FROM WEST AFRICA

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Two species of the dacetine ant genus *Strumigenys* F. Smith, are described as new. Both are subarboreal nesters and foragers and have been found in both Nigeria and Ghana in cocoa plots (*Theobroma cacao* L.). *S. cacaoensis* sp. n. is a member of the *S. rogeri* Em. group centred on the Ethiopian Region, whilst *S. pallestes* sp. n. appears to be a member of the *S. lyroessa* (Roger) group, centred on the Indo-Australian Region.

I am grateful to Dr. A. B. S. King of the Cocoa Research Institute of Ghana for the donation of his specimens and information concerning *S. cacaoensis*.

The abbreviations standardised by Brown (1953) are used here as follows: TL, total length; HL, head length; HW, head width, CI, cephalic index; ML, mandibular length; MI, mandibular index, WL, Weber's length of alitrunk; SL, scape length.

Strumigenys cacaoensis sp.n. (fig. 1)

Holotype worker: TL 2.7, HL 0.83, HW 0.72, (CI 87), ML 0.38, (MI 46), WL 0.76, SL 0.45.

Head massive, general shape as shown in fig. 1. Dorsum of head at clypeal apex and between frontal carinae concave, convex posterior to this, with the dorsal surface of the occipital lobes weakly concave. Preocular notch present, profound, extending throughout the thickness of the head as a vertical groove and present on the dorsolateral cephalic border. Eyes well developed, their outer borders convex, more or less pointed in front and freely projecting into the space provided by the preocular notch. Antennal scrobes indistinct behind the eye, their ventral borders not defined. Scapes of antennae weakly swollen, the greatest width occurring proximal of the midlength. Funiculus distinctly 5-segmented, segments 2 and 3 about as broad as long, the apical segment 0.31 mm, slightly longer than the preceding segments taken together.

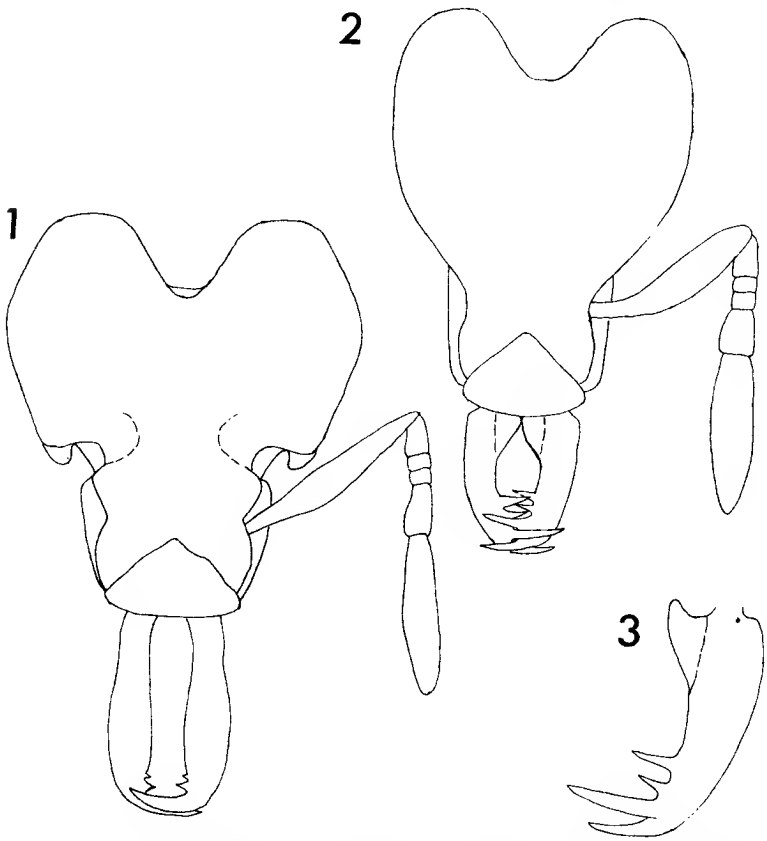
Mandibles narrow at the base, broadening apically, their outer margins weakly convex, interrupted by a slight concavity in the basal third of their length. Preapical mandibular armament of two short teeth situated close together and close to the apex, the distal tooth slightly longer and more acute than the proximal. Apical dentition not clearly visible in the holotype in which the mandibles are closed, but in three paratype specimens with open mandibles the apical armament is found to be asymmetrically developed. Dorsal tooth of the apical fork about 0.12 mm, the ventral component about 0.8 times this length. The right mandible bears a minute intercalary denticle at the base of the inner (dorsal) border of the ventral spiniform tooth. On the left mandible this denticle is also present, along with a short spiniform intercalary tooth about 0.4 times the length of the dorsal component of the apical fork and situated just below it. What can be seen of the apical armament of the holotype agrees with this description.

Alitrunk slender; weakly marginate laterally, maximum width of pronotum ca. 0.36 mm, about half the maximum head width. Pronotum in dorsal view narrowly rounded in front, without well-defined humeral angles. Promesonotal suture absent. Propodeal spines moderately long, acute, weakly upcurved and divergent, connected by an extremely narrow lateral strip running down the declivity to a pair of small triangular lamellae at the base of the declivity.

Petiole with a long peduncle, the node narrowly rounded in profile. Spongiform appendages absent, the mid-ventral strip reduced to a vestige. Post petiole more broadly rounded above, its tergite bordered by a thin lamelliform strip, broadest posterolaterally. A small ventral appendage present.

Mandibles weakly sculptured, shining. Head, alitrunk and pedicel everywhere opaque, very finely and densely punctate, with a granular appearance. Punctures on the dorsum of the head slightly more coarse than those on alitrunk and pedicel. Dorsum of promesonotum overlaid by a sparse, very fine longitudinal rugulation. Gaster dully shining. Basigastric costulation of first tergite fine and dense, extending about half the length of the segment.

Head with numerous small appressed spatulate hairs, densest around the margins of the occipital lobes and sides of head behind eyes, and in a broad median longitudinal band from the occiput to the frontal carinae. Larger spatulate hairs on the



Figs. 1–3.—1, *Strumigenys cacaoensis* sp.n., holotype worker, head in dorsal view, pilosity and right antenna omitted; 2, *S. pallestes* sp.n., holotype worker, head in dorsal view, pilosity and right antenna omitted; 3, *S. pallestes* sp.n., paratype worker; left mandible.

anterior clypeal margin directed weakly towards the midline; those on the scapes curved apically. Promesonotum with one pair of clavate hairs and a sparse ground pilosity of closely appressed small spatulate hairs. Petiole and postpetiole each with a pair of clavate hairs placed posterodorsally, the postpetiole also with a smaller pair situated anterodorsally. Gaster with six transverse rows of clavate hairs of which 4 rows are on the first tergite. Colour uniform medium brown.

Paratype workers agree closely with the holotype but on some specimens the promesonotal rugulation is more distinct and somewhat more coarse. The shape and

size of the propodeal spines vary slightly, one specimen has straight spines, noticably broader than in the holotype. Range of cephalic dimensions in paratype workers shows: HL 0.83–0.86, HW 0.72–0.76, ML 0.38–0.40, CI 87–89, MI 46–47.

A paratype female (alate) has dimensions, HL 0.86, HW 0.79, ML 0.40, CI 92, MI 46, the head somewhat broader in proportion to its length than in the workers. An infuscated area present around each ocellus and a V-shaped infuscated strip connecting the median to the posterolateral ocelli. Eyes well developed. Dentition as worker but the apical intercalary denticle on each mandible better developed. Alitrunk with flight sclerites; dorsum of mesoscutum with distinct fine longitudinal rugulation. Propodeal spines straight, the lamellae running from them to the triangular basal lamellae better developed than in worker. Node of petiole weakly excised medially, the midventral strip better developed. Other characters as worker.

The type series, including holotype, twelve paratype workers and the paratype female discussed above were taken from a nest in a shallow rot-hole in the trunk of a cocoa tree (*Theobroma cacao*), about 5 feet above ground level and at the point of divergence of two main branches at Gambari Experimental Station of the Cocoa Research Institute of Nigeria (Ibadan) Nigeria, 10 July, 1969. Holotype and 7 paratypes (including the female) to be deposited in the British Museum (Natural History) London; the remaining 6 paratypes to the Museum of Comparative Zoology, Harvard College.

At the time of collecting, no workers were observed on the tree outside the nest. The bark of the tree was wet due to a recent rain storm.

Apart from the above, three workers and an alate female were collected on 28 August, 1970, at Tafo, Ghana from the stub of a rotten cocoa branch about 3 feet above ground level. The workers agree well with the above description and their cephalic dimensions fall within the range stated above, but in all three the distal preapical tooth on both mandibles is considerably larger than the proximal, which is reduced to a minute denticle. This is also true of the female which is larger than the paratype female (HL 0.90, HW 0.81) but otherwise similar.

The species has also been collected by Dr. A. B. S. King of the Cocoa Research Institute of Ghana (November, 1969, Tafo, Ghana) who obtained workers by using a pyrethrum knockdown technique on 'Amazon' cocoa. Dr. King reports that the species is present in 2 or 3 of every 1000 knockdowns performed.

In the two specimens retained by him the preapical mandibular armament is similar to that described for the type series.

The form of the mandibles, alitrunk and head places the species in the *Strumigenys rogeri* group, and the presence of a well-developed preocular notch shows it to be related to a smaller series of species including *S. rogeri* itself as well as *S. grandidieri* Forel, *londianensis* (Patrizi), *bernardi* Brown, *pretoriae* Arnold and *rufobrunea* Santschi.

Of these species *S. cacaoensis* is apparently closest related to *S. grandidieri* of Malagasy with which it agrees in head form, indistinct antennal scrobes, preocular notch represented on the dorsolateral border of the head, preapical mandibular armament and sculptural details.

It differs from *S. grandidieri* in the following respects:

1. Smaller; dimensions of *S. grandidieri* given by Brown (1954: 12) are TL 5.02, HL 1.33, ML 0.69, CI 76, MI 52.
2. Presence of an intercalary tooth and denticles in the apical mandibular armament, absent in *S. grandidieri*.

In the key given by Brown (1954: 10–12) *S. cacaoensis* will run out at the second part of couplet 3, where it immediately separates as the distal preapical tooth is larger than the proximal.

From the circumstances of the three collections made of *S. cacaoensis* it is apparent that the species is a subarboreal nester and forager, and the occurrence of workers individually in pyrethrum knockdowns from cocoa trees indicates diurnal activity. Ground searching and Berlese funnel samples have failed to reveal the species. Alate females are in the nest in July-August but have not been recovered from light traps.

Strumigenys pallestes sp. n. (figs. 2–3)

Holotype worker: TL 2.1, HL 0.56, HW 0.40, (CI 72), ML 0.19, (MI 34), SL 0.24, WL 0.55.

Preocular notch absent; eyes small, their maximum diameter slightly less than the maximum width of the scape, invisible in dorsal view. Antennal scrobes deep, well defined, with a short median—longitudinal carina anteriorly, extending half the distance between the antennal insertion and the eye. Antennal scapes weakly curved posteriorly in the basal third of their length, the greatest width approximately at the midlength. Apical funicular segment 0.21 mm about 1.3 times the length of the preceding four segments together. Holotype with mandibles fully closed, the blades enclosing a large vacuity, attennuated basally. Mandibles very broad at the base, tapering apically; the external border convex, suddenly inflected towards the midline close to the base. Internal borders weakly concave. Preapical dentition of two acute teeth, the distal shorter than the proximal, both slightly recurved. Remaining features of mandibular structure noted from a paratype worker with open mandibles. Internal margin of blade with a massive, translucent triangular basal lamella, its apex directed posteriorly. This structure is concealed by the clypeus when the mandibles are closed (fig. 3). Basal width of blade including lamella about 0.08 mm, so that the mandible is only 2.5 times longer than its basal width. Apical fork of mandible with a long dorsal and a shorter, more stout ventral tooth. An adventitious tooth arises from the ventral base of the ventral component of the apical fork and a minute denticle is present between the two.

Alitrunk dorsally broadest in front, maximum width about 0.26 mm, weakly margined laterally. Pronotum broadly rounded anteriorly, the sides convergent throughout the length of the promesonotum, weakly divergent on the propodeum. Posterior portion of mesonotum gently sloping to metanotal suture which is not impressed. Propodeum sloping to the spines which are broadly triangular and lamelliform, each subtended by a very broad (0.07) infradental lamella, which is weakly convergent through the depth of the declivity.

Peduncle of petiole long and narrow in dorsal view, the node about 4 times broader than the peduncle at its mid-length. Anterior margin of node shallowly excised in dorsal view, the sides diverging to about the midlength and converging behind. Postpetiole subovate, scarcely broader than petiole. Fungiform appendages massively developed on both segments. Petiole with a very deep midventral strip and a large posterolateral appendage, connected to its counterpart on the opposite side by a narrow strip behind the node. Postpetiole with large posterolateral and ventral appendages.

First gastral segment with a dorsal anterolateral translucent lamelliform prominence on each side, projecting to the posterior portion of the lateral fungiform appendages of the postpetiole, and upon which the basigastric costulae arise.

Mandibles weakly shining; head finely and densely punctate. Alitrunk more weakly and superficially punctate, overlaid on the promesonotal dorsum by a fine longitudinal rugulation. Dorsum of petiole node shiny, with some very weak transverse striation. Postpetiole unsculptured, smooth and polished. Basigastric costulae radiating from the anterolateral projections on each side of the first tergite, about 0.5 times the length of the tergite.

Dorsum of head with abundant short spatulate hairs. Dorsolateral margin of head behind level of eyes with longer, anteriorly curved hairs. Dorsum of promesonotum with numerous short spatulate hairs, mostly curved towards the midline, and with 5 pairs of long erect clavate hairs situated on the dorsolateral margins. The

longest of this series projecting laterally from the humeral angles. Propodeum devoid of hairs except for a small flattened hair in front of each spine.

Both segments of pedicel with two transverse rows of clavate setae, the posterior petiolar row with 4, posterior postpetiolar with 6 hairs. Gaster with seven rows of long erect clavate hairs with 8–10 per row.

Colour uniform medium brown.

Paratype workers agreeing with holotype. In one specimen the promesonotal rugulation is more distinct, the puncturation more effaced. Range of cephalic measurements: HL 0.52–0.56, HW 0.38–0.41, (CI 72–74), ML 0.18–0.19, (MI 34–35). Paratype female (alate) with headlength at maximum of worker range, width somewhat greater. HL 0.56, HW 0.44 (CI 79). Other measurements, TL ca. 2.2 mm. ML 0.20, (MI 36), SL 0.24, WL 0.86. Answering to description of worker but eyes better developed, maximum diameter about 0.09–0.10. Alitrunk with flight sclerites, the mesokatepisternum unsculptured. Longitudinal rugosity on mesoscutum very weak.

Type series of holotype, six paratype workers and an alate female taken from an old moss-covered rot-hole in the trunk of a cocoa tree (*Theobroma cacao*) about 4 feet above ground level. Wood in the rot-hole very moist and friable, in places reduced almost to soil. Taken at the Cocoa Research Institute of Ghana, New Tafo, Eastern Region of Ghana on 22 July, 1970. Holotype and 4 paratypes (including female) in British Museum (Natural History) London, 3 paratypes to Museum of Comparative Zoology, Harvard College. A series of nine workers taken from a rot-hole in a cocoa tree trunk about five feet above the ground, 13 June, 1969 at Gambari Experimental Station of the Cocoa Research Institute of Nigeria (Ibadan) agree with the above description but are somewhat lighter in colour and more weakly sculptured. The postpetiole shows faint traces of longitudinal striation close to the dorsolateral margin. Dimensions fall within the range given for paratypes above.

The affinities of *S. pallestes* are at present in doubt. The mandibular armament is similar to that of the South African *S. marleyi* Arnold, from which it differs as follows:

1. Smaller. Brown (1954) gives the following measurements for *S. marleyi*, HL 0.62, ML 0.22, WL 0.60, CI 76–77, MI 35–36.
2. Maximum eye diameter in *S. marleyi* distinctly greater than maximum width of scape. In *S. pallestes* the eye diameter is slightly less than the scapal width.
3. Promesonotum in *S. marleyi* devoid of specialised erect hairs. In *S. pallestes* the promesonotum is bordered on each side with five erect clavate hairs, of which the first projects laterally.

Brown (1954: 25) considers *S. marleyi* to be convergent on members of the *S. lyroessa* group of the Indo-Australian region in mandibular structure, but neither he nor Arnold (1917: 378) mentions the presence in *S. marleyi* of a massive triangular lamella at the internal base of each mandible. This character is however noted by Brown (1948) in members of the *S. lyroessa* group. It is therefore possible that *S. pallestes* is a member of the last named group of species, and if so is its first member to be recorded outside the Indo-Australian region.

The nest sites of *S. pallestes* indicate a subarboreal habit. No individuals were noted ouside the nests at the times of collection, and the species has not been recovered by pyrethrum knockdown technique. Whether this indicates nocturnal foraging is open to doubt as the species is small enough to be glued to the tree by the surface tension of the pyrethrum droplets. Alate females are in the nest in July, but have not yet been recovered from light traps. The species has not been taken from Berlese funnel samples of leaf litter or log mould.

References

Arnold, G., 1917, A monograph of the Formicidae of South Africa, *Ann. S. Afr. Mus.*, **14** (3): 271–402. **Brown, W. L. Jr.,** 1948, A preliminary revision of the higher

Dacetini, *Trans. Am. ent. Soc.*, **74**: 101–29; 1953, Revisionary studies in the ant tribe Dacetini, *Amer. Midl. Nat.*, **50**: 1–137; 1954, The ant genus *Strumigenys* Fred. Smith in the Ethiopian and Malagasy Regions, *Bull. Mus. comp. Zool. Harv.*, **112** (1): 1–34.

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